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Exp 0389





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C. O. A. C.

EXpte. INTERNO Nº

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C. O. A. C.

ARCHIVO Nº

5- B- 13

CLASIFICADO

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ARMADA ARGENTINA

Nº 04/183 "C"

Letra ESGN, COAC



**CONFIDENCIAL**

C.O.A.C.

BUENOS AIRES, 23 de marzo de 1983.

EXPIE. INTE NO Nº

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C.O.A.C.

OBJETO: E/Informe.

ARCHIV.º

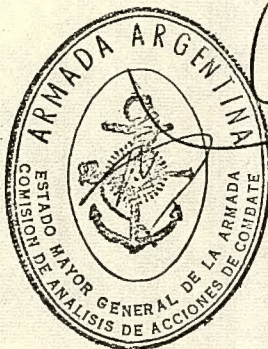
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AL SEÑOR JEFE DEL ESTADO MAYOR GENERAL DE LA ARMADA.

Adjunto elevo un informe producido por esta Comisión referente a "ALISTAMIENTO DE MEDIOS NAVALES" que consta de quince (15) fojas útiles.

Dicho estudio ha sido confeccionado en base a los informes elevados por las Unidades de la Flota de Mar y aquellos elaborados como consecuencia del Operativo "TRONADOR" y de artículos de revistas especializadas.

AGREGADOS: Lo que se indica en el texto.-



ANGEL M. RODRIGUEZ  
CONTRAALMIRANTE  
PRESIDENTE

**CLASIFICADO**







**CONFIDENCIAL**



COMISION DE ANALISIS DE ACCIONES DE COMBATE

ALISTAMIENTO DE MEDIOS NAVALES

1. HISTORIA DEL PROBLEMA:

De la definición de "PODER MARITIMO" dada por la publicación "Doctrina Fundamental para la Conducción de las Fuerzas Navales de la Armada Argentina" podemos extractar lo siguiente "El Poder Marítimo es la medida de la capacidad total de una nación para explotar los beneficios que brinda el mar. Es la conjunción e integración de los Intereses Marítimos y el Poder Naval que los respalda". El Poder Naval en su concepción integral, naval - aeronaval - anfibia, permite en forma exclusiva y excluyente el cumplimiento de las siguientes operaciones:

- a) El desplazamiento de fuerzas significativas para su empleo en lugares a las que no es posible alcanzar o resulta ventajoso hacerlo a través del mar.
- b) El mantenimiento de las comunicaciones marítimas, para el sostén de operaciones y para la provisión de materiales, bienes o elementos que hacen al aspecto militar o a la economía de guerra.
- c) El ataque a blancos en territorio enemigo por medios navales.

En base a ello podemos decir que el conflicto de Malvinas encontró al Poder Marítimo propio inerte, sin planes ni previsiones y debieron improvisarse medidas que, por su misma naturaleza, no fueron precisas, ajustadas y eficientes.

En contraste, el rápido alistamiento de medios navales y marítimos de todo tipo puesto de manifiesto por Gran Bretaña muestra, indudablemente, una excelente preparación para su movilización.

El mismo fue consecuencia de planes de emergencia formulados en 1978 por la OTAN para el alistamiento rápido de buques específicos de las Marinas Mercantes de las naciones miembros para época de CRISIS y de correctas medidas y previsiones tomadas con suficiente antelación.

De los informes elevados por las unidades de la Flota de Mar, de los informes elaborados como consecuencia del Operativo "TRONADOR" y de artículos de revistas especializadas podemos resumir lo siguiente:

1.1. Del Señor Comandante de la Primera División de destructores.

"No existe buque de apoyo logístico en el mar para aprovisionamiento de munición, repuestos, víveres y equipo y que a su vez pueda efectuar reparaciones navales".

1.2. Del Destructor A.R.A. "HERCULES"

"Se observa la falta de buques de apoyo logístico en el mar, para reaprovisionamiento de víveres, repuestos y equipos, como así también buques donde puedan ser efectuadas reparaciones menores".







- 1.3. Del Destructor .A.R.A. "SANTISIMA TRINIDAD" y de la entrevista con el Sr. Segundo Comandante.

"Desarrollar los necesarios puntos de apoyo en el litoral marítimo".

"En el planeamiento se previó que la APCA desembarcara desde un Destructor Misilístico no preparado a esos efectos. Con la colaboración de Talleres Generales se instalaron 6 estaciones para desembarco en bote de goma, a último momento".

- 1.4. Del Destructor A.R.A. "PY"

"Carencia de buques logísticos integrales. El apoyo de bases y apostaderos navales en el litoral, en caso de haberse necesitado, no se podría haber concretado (munición, combustible, infraestructura en general)."

- 1.5. De la División Corbetas.

"Prever también la utilización del buque de Desembarco A.R.A. "CABO SAN ANTONIO" dadas sus capacidades, como apoyo logístico de la División Corbetas".

- 1.6. Del Buque de Desembarco A.R.A. "CABO SAN ANTONIO".

"El personal embarcado superó en mucho las capacidades reales del buque con los consiguientes inconvenientes de habitabilidad lo que fué solucionado precariamente alojando personal en paños, pasillos y vehículos".

"Unidad sumamente apta para apoyo logístico de cualquier tipo de operaciones, dado que cuenta con suficiente personal técnico, embarcaciones y capacidad de alojamiento de personal, almacenamiento de víveres y agua".

- 1.7. Del oficio COOP, OF9 N° 27/79 "S" del COMANDO DE OPERACIONES NAVALES "Sostén Logístico Móvil de las Fuerzas Navales"

"Deficiente por: Carencia de un Sostén Logístico Móvil eficaz. El único buque tanque de la Flota ha quedado desactualizado y está en cierta medida obsoleto.

No se dispone de buque de reaprovisionamiento naval de combustibles livianos, munición, misiles, ni reparaciones menores"

Del mismo informe en el punto 1.7.2. "no disponibilidad de más buques aptos para operar varando en Caleta "La Misión" y/o Río Gallegos, tipo BDT "CABO SAN ANTONIO".

"Debe tomarse la decisión de adquirir el buque relevo del "PUNTA MEDANOS" de acuerdo a los estudios aprobados."

"Estudiar con los organismos nacionales (SEIM-ELMA-YPF) la adaptación y/o construcción de los buques necesarios (petroleros y transportes auxiliares) que permitan el reabastecimiento de unidades navales, así como para los puertos el desarrollo de la infraestructura necesaria para el eficiente manejo de las cargas".

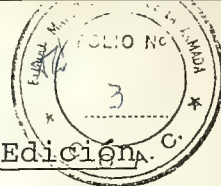
"Los puntos de apoyo fijos en el litoral marítimo no brindan el apoyo mínimo necesario para las operaciones".

"El apoyo logístico móvil de la Flota fue insuficiente, dado que se reduce a la provisión de combustible, y se debió apelar a buques de YPF, no totalmente aptos y con problemas en la maniobra".









1.8. De la Publicación R.O.2-052 "MANUAL DE EMBARCO" 2° Edición.  
Art. 7.

"El empleo de buques mercantes se dará normalmente cuando se ejecuten grandes movimientos de tropas y no se puedan cubrir todas las necesidades por la insuficiencia de buques anfibios".  
"Se dispondrá en los archivos de los Comandos que intervengan en el planeamiento, de los planos de éstos buques, con los datos de sus características. La actualización de estos datos revistará particular importancia".

1.9. De la Revista PROCEEDING (Agosto de 1982) artículo del Almirante JAMES HOLLOWAY (USA) Comentando el conflicto de MALVINAS.

"La Argentina tiene una marina con equipamiento en parte muy viejo y de segunda mano, enfrentándose a otra marina (Británica) con sus capacidades no diseñadas para la misión que está realizando".

"El hecho es que si la Marina Americana se encontrara en una situación en que se necesitare una gran cantidad de buques mercantes, tenemos el concepto de TRANSPORTE MARITIMO. Nosotros le proveemos un subsidio a la marina mercante para tener disponible hasta el 50% de todos los buques".

1.10. Del Artículo "A CORPORATE ENDEAVOR" de la revista SEA POWER (Sep. 1982).

"Muchos de los buques mercantes fueron convertidos para uso militar en tan solo 48 horas en los Astilleros Navales de PLYMOUTH, PORTSMOUTH, CHATHAM y ROSYTH. Los astilleros trabajaron día y noche instalando plataformas de helicópteros en 19 buques y en todos la maniobra para reabastecerse de combustible en el mar".

"Estas conversiones hechas en un promedio de menos de una semana fue posible por lo siguiente:

1. Gran Bretaña tenía planes desde hace mucho tiempo para tomar posesión de buques mercantes seleccionados, para ser empleados con fines militares.

2. Los Staff civiles de diseño y planeamiento del Ministerio de Defensa reaccionaron con admirable rapidez. El personal de diseño voló hacia puertos en ultramar para unirse a los buques requisados en su viaje de retorno a los Astilleros y trabajaron durante la navegación en los problemas de instalación de los equipos y fortalecimiento de cubiertas para instalar plataformas de helicópteros y/o armamento. Los dibujos técnicos ya habían sido terminados cuando los buques llegaron a Puertos Británicos".

"El uso de buques portacontenedores para transporte y despliegue de aviones V/Stol y helicópteros confirmó el concepto del sistema ARAPAHO".

"El Atlantic Conveyor, Atlantic Causeway y el Astronomer resultaron de enorme valor transportando aviones Harrier y Sea Harrier y helicópteros de la RAF y de la RN".









1.11. De la revista "Tecnología Militar" (Nº 6/81)

"...un sistema de la Marina Norteamericana denominado ARAPAHÓ. Básicamente se aprovecha de los cientos de buques portacontenedores de alta velocidad y gran desplazamiento existentes hoy en los inventarios de la OTAN".

"Con su moderna prestación, pequeñas tripulaciones y grandes cubiertas sin obstrucciones, son candidatos excepcionales para servir de base temporal a aviones ASW/AEW..."

"...El sistema ARAPAHÓ parece tener una repuesta a este requerimiento. Emplea una estructura modular básica de dimensiones idénticas a los contenedores standard, para formar componentes de un hangar, locales de guardia, mantenimiento de aviones y almacenaje, grupos generadores independientes, habitabilidad para personal de la marina y suministro de combustible para aviación".

2. HECHOS QUE INFLUYEN PARA LA SOLUCION.

En el problema en estudio hay que considerar dos aspectos, que por sus características, admiten diferentes soluciones.

El primero de ellos es el referido a la obtención de buques de apoyo móvil para uso de la Armada en sus operaciones específicas. Estas unidades serían para uso exclusivamente militar.

El segundo es el relacionado con disponer, en el momento oportuno, de unidades mercantes previamente seleccionadas por sus características y de las medidas necesarias para lograr un rápido alistamiento y adaptación al uso militar, es en definitiva la utilización de la capacidad de la nación para satisfacer, en caso de conflicto, los requerimientos logísticos de sus Fuerzas Armadas.

La solución de ambos aspectos representa en consecuencia, la única manera de constituir un PODER NAVAL "orgánico y funcional, el cual así estructurado permita la obtención del máximo rendimiento de sus posibilidades" (DOCFUARA 1 - Art. 115).

Es importante también recordar la misión impuesta al entonces Comando de Transportes Navales, al ser creado por decreto Nº 6340 del Poder Ejecutivo Nacional de fecha 31 de marzo de 1952: "UTILIZAR, DIRIGIR Y OPERAR LOS TRANSPORTES NAVALES, A FIN DE SATISFACER LOS REQUERIMIENTOS DE TRANSPORTE MARITIMO PARA EL SOSTEN LOGISTICO Y OPERACIONES DE LA MARINA DE GUERRA Y DE LAS FUERZAS ARMADAS DE LA NACION", agregando en el Artículo 3ro del decreto mencionado: "Cuando los requerimientos lo permitan los Transportes Navales podrán ser empleados circunstancialmente en Tráfico Marítimo de interés Nacional".

Realmente parecería que se hubieran invertido las prioridades indicadas anteriormente y que circunstancialmente los Transportes Navales pueden ser empleados para el sostén logístico y operaciones de la Armada.

Debe considerarse también que, al no haber implementado algunas de las Acciones Recomendadas en el año 1979, luego de los estudios hechos con motivo del operativo "TRONADOR", la actual situación político-económica hace, por el momento, poco factible y







aceptable la adquisición y/o construcción de buques para uso militar, por lo que las posibles soluciones son de compromiso y hay que encontrarlas dentro de las unidades actualmente en Servicio.

Otro hecho a tener en cuenta son las Acciones Recomendadas del Oficio EMGA,CK8 N° 4/82"C" con respecto a las "Deficiencias Logísticas observadas - Medidas para subsanarlas", algunas de las cuales, con modificaciones, son tenidas en cuenta en el presente.

En cuanto al segundo de los aspectos del problema debemos considerar, además de las acciones recomendadas del oficio indicado en el párrafo anterior, la ampliación de la investigación a:

- 1º) Buques pertenecientes a armadores privados, Flota Fluvial y Escuela Nacional de Náutica; esta última opera como Buque Escuela el único buque con capacidad apreciable de pasaje de nuestra Marina Mercante.
- 2º) Buques Frigoríficos, buques tipo Roll on - Roll off, buques portacontenedores (para ser utilizados con el sistema ARAPAHÓ) y pesqueros de altura (principalmente para minado y antiminado).

Esta investigación debe incluir un relevamiento integral que permita conocer a fondo las posibilidades del potencial marítimo, teniendo en cuenta los requerimientos propios y los que puedan surgir de las otras Fuerzas Armadas, en base a las hipótesis vigentes.

Las normas legales vigentes deben permitir la rápida disponibilidad de las unidades previamente seleccionadas en caso de CRISIS o conflicto.

Debe preverse también una legislación que favorezca al armador que desee adquirir o construir buques mercantes con características aptas para uso militar (mayor velocidad,, mayor número de equipos de Comunicaciones, buques Ro-Ro, mayor capacidad de pasaje, etc.).

Por último hay que recordar que los únicos buques que la Marina había previsto y adaptado con antelación (petroleros de YPF) no se encontraban en el país al iniciarse la CRISIS y muy posiblemente de haber estado disponible no hubieran sido utilizados, pues no siendo este un hecho rutinario, habrían comprometido el secreto de la operación, al alertar con su pedido.

### 3. CONCLUSIONES:

- 3.1. Sin una adecuada logística no hay ni puede haber operaciones eficaces.
- 3.2. No se contó en el conflicto de Malvinas con buques de Apoyo Móvil capaces de reabastecer las unidades en el mar.
- 3.3. No se contó en los momentos iniciales de la CRISIS, con los petroleros de YPF, adaptados para reabastecimiento en el mar.
- 3.4. No se contó con un transporte de tropas, a excepción del BDT A.R.A. "CABO SAN ANTONIO", ni provisiones para ello.





- 3.5. No se cuenta con una unidad que pueda transportar rápidamente una fracción orgánica de I.M. para reconocimientos, golpes de mano, etc.
- 3.6. No hay un relevamiento adecuado para utilización de buques mercantes para fines militares.
- 3.7. No hay una legislación conveniente para la rápida disposición de buques mercantes en caso de conflicto.
- 3.8. No hay una utilización rutinaria de las unidades mercantes, en consecuencia, su uso eventual puede comprometer el secreto de una operación.
- 3.9. Al no implementarse acciones recomendadas luego del operativo "TRONADOR", deben adoptarse, soluciones de compromiso ya que la actual situación político-económica no permite soluciones integrales.
- 3.10. Se comparten las acciones recomendadas indicadas en el agregado N° 5 al oficio EMGA,CK8 N° 4/82"C", respecto a Buques hospitales, Buques de ELMA y de Transporte Navales con los agregados indicados en el presente estudio.

#### 4. ACCIONES RECOMENDADAS:

- 4.1. Materializar una capacidad anfibia para lo cual se deberá, con carácter prioritario:
  - 4.1.1. Adecuar el Transporte Polar A.R.A. "BAHIA PARAISO" como Transporte de Tropas y transferirlo a la Flota de Mar, manteniendo su utilización en comisión durante las Campañas Antárticas bajo el Comando Conjunto Antártico. (las modificaciones básicas a efectuar se indican en el Anexo ALFA).
  - 4.1.2. Convertir un destructor convencional en transporte ligero de tropas con las modificaciones indicadas en el Anexo BRAVO, esta unidad provendrá de la 2da División al reemplazarse por las nuevas unidades.
  - 4.1.3. Desafectar un transporte tipo "COSTA SUR" y transferirlo a la Flota de Mar para su utilización como buque de abastecimiento y mantenimiento con las modificaciones que se indican en el Anexo CHARLIE. El mismo podrá ser empleado de acuerdo a lo indicado en el Art. 3° del Decreto 6340 del 31 de marzo de 1952, cuando no sea utilizado por la Flota.
  - 4.1.4. La conversión de un portacontenedor en portahelicópteros con el sistema ARAPAHÓ, según lo indicado en el estudio. "HELICOPTEROS NECESARIOS PARA LA ARMADA" del COAN. El mismo deberá ser preparado para su uso militar cuando lo requiera la situación.
- 4.2. Incrementar las capacidades del Sostén Logístico Móvil para lo cual se deberá:





- 4.2.1. Prever la adaptación de un buque de transporte tipo "COSTA SUR" para ser modificado, en caso de movilización, en buque de Abastecimiento (munición, repuestos, etc.) según Anexo CHARLIE.
- 4.2.2. Recuperar las capacidades originales del dique flotante A.R.A. "Y-1" (dique seco, taller de reparaciones y su propia logística y operatividad) para mantenerlo listo a destacar a nuestro litoral (Deseado, Punta Qui-lla) a fin de adquirir capacidad de reparaciones para la Fuerza de Tareas en caso de Despliegue Estratégico.
- 4.3. Preparar nuestro potencial marítimo, para lo cual se deberá disponer:
  - 4.3.1. Un relevamiento integral de todos los buques y embarcaciones que puedan ser aplicados al requerimiento del Despliegue Estratégico de la propia Fuerza y de las otras Fuerzas Armadas.  
El mismo deberá incluir velocidades, calados, capacidades de bodegas y plumas, dimensiones de escotillas, elementos de remoción, etc.
  - 4.3.2. Seleccionar en base a lo indicado anteriormente.
    - 4.3.2.1. Un buque portacontenedores para su conversión en portahelicópteros con el sistema ARAPAHÓ, para ser utilizado según lo indicado en 4.1.4. (ver Anexo DELTA).
    - 4.3.2.2. Buques de Carga para transporte de:
      - Elementos de la propia Fuerza (prever los tres componentes).
      - Elementos pertenecientes a el Ejército y Fuerza Aérea. ( Se deberán prever los elementos en base a los planes de movilización y/o campaña; de no contarse con los mismos se deberá trabajar en base a las movilizaciones de los años 1978 y 1982).
      - Un buque frigorífico.
      - Buques con capacidad para ser transformados en hospitales flotantes.

Los buques seleccionados deben preverse en cantidad tal que puedan cubrir eventuales ausencias y/o pérdidas.

- 4.3.3. Determinar en forma pormenorizada los detalles de alistamiento de las unidades afectadas, a saber:
  - Plataformas para operar con Helicópteros.
  - Equipos para reabastecimiento en el Mar.
  - Equipos de Comunicaciones - Criptografía.
  - Equipos de CME
  - Chaff.
  - Armamento AA (liviano) 12.7 ó 20 mm.
  - Elementos y organización de Control Averías.





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- 4.3.4. Instrumentar las normas legales que permitan la rápida movilización y disponibilidad de buques mercantes y las franquicias que favorezcan y alienten al armador para la construcción y/o adquisición de buques mercantes con características aptas para uso militar (velocidad, equipos de comunicaciones, radares, capacidad de pasaje, etc.)
- 4.3.5. Confeccionar los planes para la ejercitación rutinaria, por lo menos dos veces por año, de todos los buques mercantes seleccionados.
- 4.3.6. Establecer por Sistema Automatizado una permanente actualización de los medios disponibles en el país de acuerdo con lo expresado en 4.3.2. Este Control deberá ser centralizado en el ESTADO MAYOR CONJUNTO y en el COMANDO NAVAL DEL TRAFICO MARITIMO.

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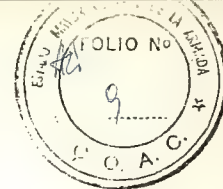
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COMISION DE ANALISIS DE ACCIONES DE COMBATE

ALISTAMIENTO DE MEDIOS NAVALES

ANEXO ALFA

Características principales del Transporte Polar A.R.A. "BAHIA PARAISO"  
y modificaciones mínimas para ser utilizado como Transporte de Tropas.

CARACTERISTICAS

	Maxima	Sostenida	Económica
<u>Velocidad (Nds)</u>	19	18	16
<u>Capacidad de desembarco</u>	4 EDPV 2 Botes a motor para 77 hombres		
<u>Cap. para helicópteros:</u>	hangar y cubierta de vuelo para 2 Sea King. puede reabastecer HL en vuelo		
<u>Cap. de Transporte de personal</u>	336 hombres, todos con camas y taquillas		
<u>Radares</u>	1 DECCA	TM/1629	
	1 DECCA	TM/1630	
	1 PLESSEY AWS-4	(aire)	
<u>Radiobaliza</u>	EGA SABRE		

MODIFICACIONES

- Instalación de basamentos para armamento AA y basamentos para lanzadores de CHAFF.
- Instalación de Jaulas lanzabombas de profundidad.
- Previsión de espacios, basamento, conexiones etc., para productores de ruidos tipo "FANFARE".
- Aumentar su capacidad de transporte de tropas..

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COMISION DE ANALISIS DE ACCIONES DE COMBATE

ALISTAMIENTO DE MEDIOS NAVALES

ANEXO BRAVO

Capacidades mínimas de un Destructor Convencional para ser utilizado como Transporte Ligero de Tropas.

- Mantener un solo compartimiento de calderas (compart. de popa).
- Mantener una sola torre de cañón de 5".
- Mantener su actual capacidad para operar con helicópteros.
- Mantener productores de ruidos.
- Retirar sonar y sistemas de armas antisubmarinas. ( no retirar jaulas lanzadoras de bombas de profundidad).
- Aumentar su capacidad de tanques para agua y combustible.
- Debe poder transportar 2 lanchas tipo EDPV y embarcaciones tipo (Zodiac).
- Habitabilidad como para transportar una Compañía reforzada de I.M. con su equipo específico (150/180 hombres).
- Incorporar armamento antiaéreo y Sistemas lanzadores de "CHAFF".

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COMISION DE ANALISIS DE ACCIONES DE COMBATE

ALISTAMIENTO DE MEDIOS NAVALES

ANEXO CHARLIE

Capacidad mínimas de un Transporte tipo "COSTA SUR" para ser utilizado como buque de Abastecimiento y Mantenimiento.

- Aumentar su habitabilidad con alojamientos en entre puentes.
- Montar talleres de reparaciones con capacidad de efectuar el 2º escalón de mantenimiento.
- Debe poder entregar munición y sería conveniente cierta capacidad de entrega de combustibles livianos (Gas-oil y turbo naval) prever y adecuar espacios para SS.BB.
- Debe tener capacidad para operar con helicópteros.
- Instalación de basamentos para armamento y basamentos y ubicación Sistemas lanzadores de "CHAFF"
- Instalación de basamento para jaulas lanzacargas de profundidad.
- Previsión del local, conexiones, basamentos, etc., para equipos adicionales de Comunicaciones y Criptografía.
- Instalación del basamento, conexiones etc. para productores de ruidos tipo "FANFARE"

**ESCRITURA**



*Luís M. Ribero Piera*  
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## COMISION DE ANALISIS DE ACCIONES DE COMBATE

## ALISTAMIENTO DE MEDIOS NAVALES

## ANEXO DELTA

Características principales de un buque portacontenedores transformado en portahelicópteros según el concepto ARAPAHO.

## Arapaho Update

By Lieutenant James J. Mulquin, U. S. Navy Reserve (Retired)

October 1982, a U. S. merchant containership conducted the first underway, shipboard tests of Arapaho, the Navy's controversial approach to effective, supplemental air defense at a low cost. The 18,000-ton *Export Leader*, outfitted with a complete aviation facility (a flight deck, hangar, fuel system, night lighting, power supply, and damage control), successfully operated six types of military aircraft.

This recent test began in late September when the basic Arapaho facility, some 900 tons of it, was trucked in 59 tractor-trailers from Lakehurst, New Jersey, to the Norfolk International Terminal. The Arapaho facility was loaded on board the *Export Leader*, on loan from the Maritime Administration's James River Reserve Fleet. The actual loading required approxi-

mately 11 hours of stevedore time. Internal hookups, checkout, and system verification took additional hours but could have been performed either underway or at anchor if the pier space had been needed for other operations.

To keep costs down, several decisions were made: the planned Arapaho personnel modules were suspended in deference to temporary use of the ship's cabin space for the brief sea trial period; the ship was partially activated—her main propulsion plant remained inactive, while her bridge, galley, living spaces, and auxiliary plant operated; a commercial tug towed the *Export Leader*, and a second tug served as a search and rescue craft.

The ship departed on 5 October and returned to pierside 7 October. During that time, 178 helicopter landings and

takeoffs were performed. The aircraft included two Sikorsky SH-3Hs, a Bell UH-1N, a Kaman SH-2F, a Boeing Vertol CH-46D, a CH-46E, and a Bell HH-1K gunship. In addition to day landings, the SH-3Hs and the UH-1N made 45 night landings—15 times with a British exchange officer on board. Along with a number of Navy and Marine Corps pilots making approaches, successful landings were recorded by West German, Australian, Canadian, and U.S. Naval Reserve pilots. Officers from the Netherlands and Chile were on board the *Export Leader* to observe the air operations.

While the *Export Leader* was underway, aircraft landed in pairs for the first time, demonstrating the safety and utility of the twin landing spots. Each





Table 1 The Arapaho Concept

<b>Dimensions:</b>	
Flight deck	200 ft. x 64 ft.
Hangar	100 ft. x 40 ft.
Personnel accommodations	40 ft. x 64 ft.
Aviation fuel modules	40 ft. x 40 ft.
Weight (fully loaded and manned)	1,200-1,300 tons
<b>Personnel:</b>	
Ship's civilian crew:	30-40 persons
Navy detachment:	65-90 persons
<b>Aircraft Capacity:</b>	
SH-3H hangaring	4 aircraft
Operational deployment	4-6 aircraft
<b>Aircraft:</b>	
UH-1, SH-2, SH-3, CH-46, CH-47, CH/RH-53, SH-60	
Max. operating takeoff weight:	45-55,000 lb.
<b>Aviation Maintenance:</b>	
Organizational (O-Level) planned	
Intermediate (I-Level) physically possible	
<b>Command, Control, Communications:</b>	
Minimal communications planned	
"Mini-TSC" possible (weight/space available)	
<b>Aviation Safety:</b>	
Sprinkler system in hangar	
Firefighting vehicles on deck	
Ship's fire mains	
<b>Utility Subsystems:</b>	
Heating, venting, and air-conditioning in all modules	
Telephone communications throughout system	
Two 250-kw. diesel generators provide aircraft starting and servicing power, plus facility power	
<b>Aviation Fuel:</b>	
Pump/reel module	
Flight deck fueling station	
JP-5 fuel in 5,000-gallon increments, up to 100,000 gal.	
<b>Primary Flight Control:</b>	
Similar to that on board an LPD-class ship	
<b>Navy Accommodations:</b>	
Series of modular, 40-ft. units, equipped as sleeping compartments, heads, showers, galley, mess decks, storage, support, etc.	
<b>Time to Install:</b>	
Load by crane from pier:	12-18 hrs.
Hook-up/check out in place:	6 hrs.
<b>Major Tests:</b>	
SH-3H (18,000-lb.) takeoffs/landings ashore (Oct. 1980)	
Compatibility verification on board the <i>Export Leader</i> (Feb. 1981)	
Sea trials (Oct. 1982)	
<b>Percentage of Cargo Displaced:</b>	
25-30% (volume); 10-20% (weight)	
<b>Modifications Required:</b>	
Minor deck fittings/tie-downs added	
<b>Ship Compatibility:</b>	
Designed for use on board any containership with standard freight modules (40 ft.) and no deck obstructions	
<b>Application:</b>	
Container-type freighters:	20-50,000 tons
LASH barge carriers:	46,000 tons
Sea-Bec barge carriers:	38,000 tons
Roll-on/roll-off (RO-RO) vehicle carriers:	17,000 tons
<b>Principal Development Activities:</b>	
Naval Air Engineering Center	
Naval Air Test Center	
<b>Current Contractor Responsibility:</b>	
Minimal	
<b>Host Ship Performance:</b>	
20-34 kts., with 1,500-3,000 containers on board	
<b>Sensor Systems:</b>	
Radar (None, except ship's commercial equipment)	
Sonar (None, although towed-array systems appear compatible)	
<b>Conversion:</b>	
Standard pierside gantry crane (30-50 tons)	
Civilian stevedore teams	
Commercial container terminal	
<b>Purpose:</b>	
Augment fleet by providing a multipurpose aviation installation, quickly loaded on board many classes of commercial ships for wartime service	
<b>Missions:</b>	
Sea-lane defense	
Convoy escort and support	
Mine warfare	
Search and rescue	
Sea-based close-air support for amphibious operations	
Casualty treatment/evacuation	
Air-capable depot ship (aviation maintenance and spares)	
Underway replenishment group aviation support	
<b>Participating in Development:</b>	
United States	Canada
United Kingdom	New Zealand
West Germany	Chile
Australia	The Netherlands
<b>Transport Requirements:</b>	
60-70 commercial tractor-trailers	
30-35 railroad flatcars	
<b>Military Airlift Compatibility:</b>	
C-5A, C-141A/B, C-130E	
<b>Aviation Shops, Power Supply, Storage:</b>	
41,000 ft. adjacent to hangar	
<b>Cost to Acquire (less aircraft/weapons):</b>	
\$15-20 million (per deployable system)	





Table 2 Pros and Cons of the Arapaho Concept

Pros

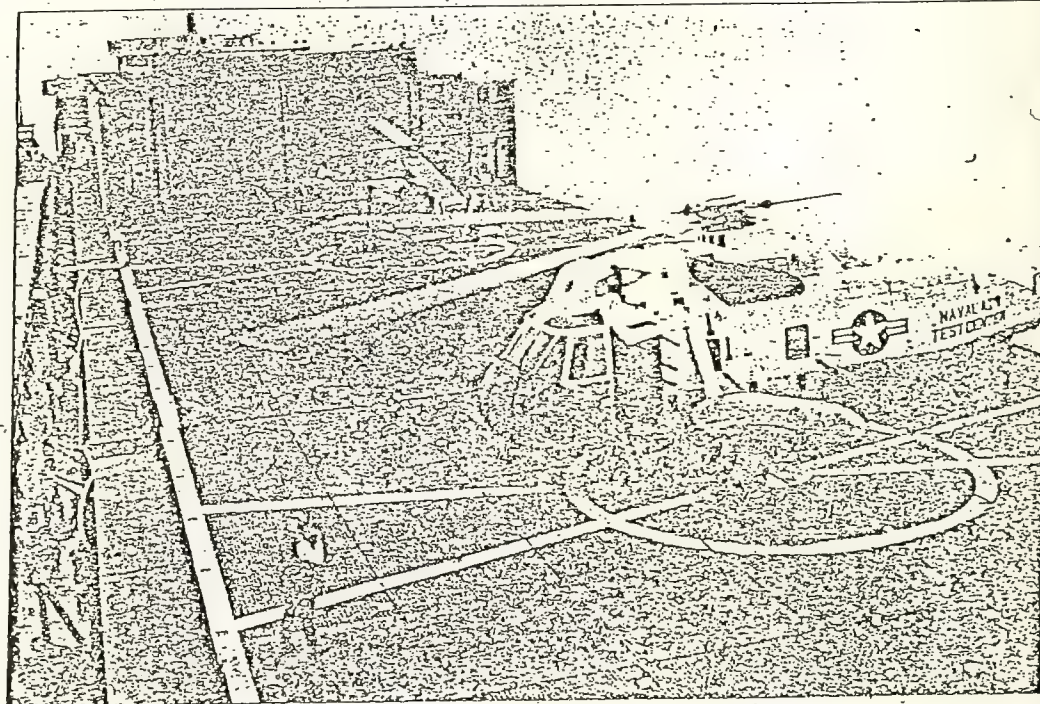
Cons

1. Arapaho represents enormous Return-On-Investment (ROI) in that it provides significant options, utility, and capability at very little dollar commitment.
2. Arapaho lowers the cost of maintaining a sea-based air deployment potential by keeping the host vessels in private hands.
3. Arapaho can be rapidly activated in wartime, radically reducing the time span for reaction to a maritime threat.
4. Arapaho will place certain Navy aircraft in a given locale at far less cost and in far shorter time than is possible with new construction.
5. Unlike other permanent systems in the fleet, Arapaho can be instantly "retired" upon resolution of an emergency.
6. In its force augmentation role, Arapaho will substantially enhance the performance and value of conventional, commissioned fleet units.

1. Arapaho adoption would be excessively costly since large quantities of ASW helicopters and similar sea-lane defense air assets would have to be procured, possibly at the expense of tactical strike aircraft.
2. Arapaho addresses a secondary, lower priority mission: convoy defense and sea-lane protection. Strike warfare would suffer.
3. Arapaho acceptance could compel a sizeable increase in both the drilling strength and assets committed to the naval reserve, each at great cost.
4. Arapaho, offering indigenous defense to convoys, creates doubt as to the need for large-scale destroyer and frigate procurement in future budgets.
5. Arapaho deployment would compound an already recognized problem in identifying sufficient cargo capacity in merchant ships for wartime deliveries.
6. Insufficiencies in helicopter ASW performance tend to diminish the overall value of Arapaho in that mission.

spot measures 64 by 100 feet and is considerably larger than landing pads on board U. S. destroyers, frigates, and guided-missile frigates. During these tests, an SH-3H was successfully hanged for the first time in the 4,000 square foot Arapaho structure, which can accommodate four SH-3-sized aircraft—with rotors and pylons folded—and enhance maintenance processes. It is estimated that an operational Arapaho detachment would deploy five to six SH-3Hs or seven 2Fs. The deck has been designed to handle the heaviest aircraft types, including the CH-53E and CH-47C. No obstacle to eventual use of the McDonnell-Douglas AV-8B has been encountered, although testing of this vertical takeoff and landing fighter-bomber has yet to be authorized.

The Hampton Roads demonstrations were noteworthy from several standpoints. They proved the system's compatibility with commercial trucks and teamster crews. Professional stevedoring teams found the Arapaho modules no more complex or challenging to maneuver than normal containerized cargo; complete compatibility was demonstrated with pier-side equipment, gantry cranes, vehicles, forklifts, and other handling components found at any typical U. S. or NATO port. The Arapaho system fit the ship perfectly, as had been forecast by its Naval Air Systems Command developers. This ship accepts a standard-sized container and typifies several hundred cargo ships of NATO



registry that could be adapted to carry Arapaho in wartime.

While helicopter antisubmarine warfare is the first mission objective, there are others: mine countermeasures, marine assault, offshore airborne logistics, amphibious close-air weapons support, casualty evacuation, vertical replenishment, and many more.

Based on this prototype, estimates are that a "bare" Arapaho, including hangar, two-spot flight deck, power

*During the first underway, shipboard tests of Arapaho on 6 October 1982, a Sikorsky SH-3H Sea King from Naval Air Test Center Patuxent River, prepares to take off from the cargo ship Export Leader. A Bell UH-1N, one of seven participating helicopters, sits on the ship's second landing spot in the background.*





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supply, heating, venting, air-conditioning, fuel supply, damage control, personnel accommodations, radio communications, and night lighting would cost approximately \$11 million. Dedicated "mission-oriented" outfitting might add another three to six million dollars, depending on its complexity, spares support, personnel requirements, etc. The basic Arapaho is intended to support a four-to-six aircraft detachment and about 80-100 Navy or Marine Corps personnel. Air assets could come from mobilized reserve units or from the private helicopter community, presuming proper planning, training, and equipping in advance.

Many foreign governments are interested in Arapaho. The British Government hurriedly recruited and deployed Arapaho-like facilities on board at least 14 private ships during the recent Falklands crisis, to provide temporary adequate air cover and air logistics support.

Arapaho's future is uncertain. The Senate's calls for additional operational testing and investigation of tactical use have underscored interest in further development. The Marine Corps confirmed its interest by providing several types of aircraft for Arapaho demonstrations both ashore and at sea. An earlier offer from the United Kingdom of a fully operable

cargo ship for extended underway tests is indicative of growing NATO concern for both defense and costs, and of the prospect of merchant ship air operations in various mission roles.

Despite these expressions of growing interest, costs of further evaluation may force the mothballing of Arapaho until an actual wartime emergency. That decision will likely be made soon.

Lieutenant Mulquin received bachelor's degrees from Georgetown University and Catholic University, and a master's degree from George Washington University. He is currently the Navy's Arapaho Project Manager at Naval Air Systems Command Headquarters.



*Luis M. Ribero Piera*  
LUIS M. RIBERO PIERA  
CAPITAN DE FRAGATA





BUENOS AIRES, 1º de noviembre de 1983.

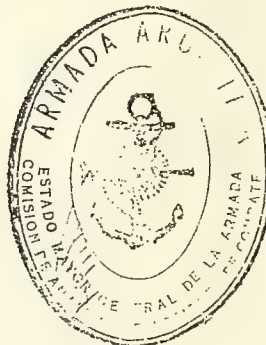
OBJETO: E/Informe




AL SEÑOR JEFE DEL ESTADO MAYOR GENERAL DE LA ARMADA.

Adjunto elevo una traducción de la Editorial "NAVAL FORCES" referida a, "Que es un buque de guerra", para ser agregado como Anexo ECHO al informe producido por esta Comisión, referido a "ALISTAMIENTO DE MEDIOS NAVALES" y que fuera elevado por Oficio ESGN, COAC Nº 4/83"C".

AGREGADOS: Anexo ECHO (3) fojas.



  
MIGUEL ANGEL GRONDONA  
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A CARGO DE LA PRESIDENCIA





ALISTAMIENTO DE MEDIOS NAVALES

ANEXO ECHO

EDITORIAL DE "NAVAL FORCES" VOL IV/1983 (Pag. 7)

¿QUE ES UN BUQUE DE GUERRA?

Por el Vicealmirante (R) Sir IAN Mc GEOCH.

Se ha señalado recientemente que los buques de guerra parecen haber se vuelto casi tan vulnerables al daño o destrucción como los buques mercantes a los que se supone tienen que defender..

Se formula entonces la pregunta "¿Por que no armar los buques mercantes y dejarlos que se cuiden por sí solos?" El aterrizaje a salvo a bordo del pequeño carguero español "ALRAIGO", por parte de un Sea Harrier que había extraviado su ruta de regreso a su portaaviones, el HMS "ILLUSTRIOUS", el pasado mes de junio, agrega énfasis a esta pregunta. También se refuerza esta idea en función de los estudios detallados llevados a cabo en Gran Bretaña bajo el rótulo general de "Buques Mercantes requisados" (SHIPS TAKEN UP FROM TRADE-STUFT). Dichos estudios prevén la "Conversión en tiempos de guerra de buques mercantes" (WARTIME ADAPTION OF MERCHANT SHIPS-WAMS) a los que se divide en tres categorías. La primera categoría contempla el "Sistema containerizado de defensa aérea para buques" (SHIPBORNE CONTAINERISED AIR DEFENCE SYSTEM-SCADS). Este sistema proveería a buques porta contenedores grandes adecuados, con instalaciones completas para operación y apoyo logístico de aeronaves V/STOL más equipamiento naval para Comunicaciones, Comando y Control y un sistema misilístico de defensa puntual. Estos buques deben ser tripulados por Personal de la Armada y deberán considerarse buques de guerra. De la misma manera que los cruceros auxiliares (mercantes armados) de la Primera Guerra Mundial y los portaaviones "WOOLWORTH" de la segunda, las unidades propuestas ayudarán a compensar la inevitable escasez de buques de guerra para la defensa del Tráfico Oceánico.

En el pasado todos los buques de guerra del tamaño de un crucero ligero o mayor tenían coraza para proteger sus partes vitales, lo que era un incremento importante de su poder combativo en relación con los buques mercantes convertidos.

Esto ya no es válido en la actualidad. Sin embargo, el buque de guerra construido como tal de nuestros días tiene sonar y armas A/S, un sistema significativo de contramedidas antimisil tanto activas como pasivas, equipamiento C3 completo, armamento de defensa AA de área (probablemente) y está diseñado para un efectivo control de averías, lo que no se puede lograr en un buque mercante sin detrimento de su función normal.

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La segunda categoría de conversión de buques mercantes para tiempo de guerra sería para cumplir funciones de auxiliares adicionales de la flota. Esto significa que se los necesitará para incrementar el sostén logístico de los buques de guerra en las Areas de Operaciones o sus inmediaciones transportando combustible, munición, abastecimientos, repuestos y víveres. Estos buques estarían bajo control operativo naval y serían tripulados por civiles (excepto las dotaciones de armas y comunicaciones) y constituirían los "buques mercantes con armamento defensivo" de primera clase (DEFENSIVELY ARMED MERCHANT VESSELS - DEMS). Estos buques deberían llevar probablemente un helicóptero A/S como mínimo, un sistema misilístico de defensa puntual y un sistema pasivo de contramedidas del tipo de un lanzador de "chaff".

Este nivel de armamento y equipamiento podría llevarse a cabo con es caso detrimento de la función logística primaria de estas unidades y, como se demostró en las operaciones en el Atlántico Sur en 1982, los buques seleccionados pueden prepararse para sus funciones de tiempo de guerra en pocos días.

Llegamos ahora a la tercera categoría de conversión de buques mercantes para tiempo de guerra, es decir los "buques mercantes con armamento defensivo" de segunda clase (DEFENSIVELY ARMED MERCHANT VESSELS - DEMS). Esta incluiría a todos los buques mercantes oceánicos que podrían tener que entrar en una zona de guerra a fin de mantener abastecido con los "insumos vitales de guerra" a un país y sus aliados. En el caso de Guerra en el Mar como parte de un conflicto armado entre la NATO y el pacto de Varsovia - una contingencia citada con frecuencia por las autoridades navales de EE.UU y Gran Bretaña cuando presentan sus requerimientos - se usan en paralelo para demostrar la magnitud de la amenaza potencial al tráfico marítimo de la NATO en el Atlántico Norte. El primer grupo menciona una cantidad de unidades de escolta del orden de las 800 entre las que se incluían portaaviones A/S, amén de 1000 aviones marítimos, que se dice fué lo que se necesitó para derrotar en 1943 a aproximadamente 50 submarinos alemanes desplegados en operaciones. Esta suposición en el sentido que las simples cifras ganaron la victoria es falsa.

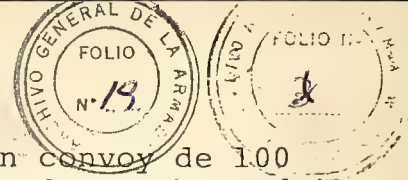
En primer lugar, fué la presencia de aviones marítimos A/S eficientes materializada en todos los convoyes a lo largo de su tránsito en el Atlántico lo que forzó a los submarinos a abandonar sus operaciones en superficie, con lo que perdieron su movilidad y su capacidad de concentrarse para atacar. El agregado tardío de aproximadamente 40 aviones con gran radio de acción, operando principalmente desde Islandia, fué de una importancia crítica.

El despliegue de sonares remolcados de tipo "array" puede muy bien tener un efecto inhibidor similar sobre la movilidad y efectividad de los Submarinos Nucleares soviéticos que actúen contra el Tráfico Marítimo en el Atlántico Norte.

El segundo grupo de cifras sospechoso se relaciona con el tonelaje de abastecimientos de toda clase a transportar a través del Atlántico que se considera imprescindible a fin de sostener la Guerra en Europa, en caso de una agresión soviética. Estas cifras tienden a exagerarse. En realidad las importaciones de Europa Occidental en tiempo de paz son del orden de 500 millones de toneladas por año. En tiempo de guerra una cifra del orden de 25% menor debería ser suficiente para mantener la moral de la población civil.

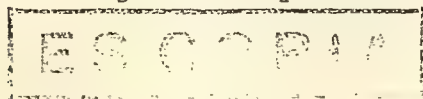


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Esto significaría el arribo seguro y oportuno de un convoy de 100 buques por día a algún lugar de Europa. Operando desde una base única y lejana (Murmansk) la flota del Norte y la Aviación Naval soviéticas tendrían por delante una tarea dura si quieren imponer pérdidas insoportables en este Tráfico Marítimo. No hay duda que los convoyes de especial importancia, que transporten refuerzos militares y materiales de guerra, serán marcados especialmente para ataques concentrados aéreos y submarinos, pero obviamente estarán mejor defendidos y apoyados. Por encima de todo, aún un armamento defensivo modesto y principalmente pasivo en todos los buques mercantes puede mejorar sus posibilidades de supervivencia frente a misiles, lanzados tanto desde la superficie, como por encima o por debajo de ella.

Sin embargo, sigue siendo vital la necesidad del máximo número de los mejores buques de guerra de que se pueda disponer.



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CONFIDENCIAL



BUENOS AIRES, 20 NOV 1983

OBJETO: E/Fotocopias suplemento especial.

AL SEÑOR JEFE DEL ESTADO MAYOR GENERAL DE LA ARMADA.

Adjunto elevo fotocopias de las páginas 32, 33, 40 y 44 del Suplemento Especial "BREMER VULKAN" de la revista "NAVAL FORCES" N° IV/83 para ser agregadas como Anexo FOX TROT al informe producido por esta Comisión, referido a "ALISTAMIENTO DE MEDIOS NAVALES", que fuera elevado por Oficio ESGN, COAC N° 4/83 "C".

Dichas páginas contienen información básica de diversas unidades de desembarco y de sostén logístico de dimensiones modestas y diseño aparentemente simple, cuya construcción podría encararse en el país.

Aprecio que la eventual construcción de tales unidades constituye un modo de acción alternativo a los ya expuestos en los puntos 4.1 y 4.2 del informe de referencia Of. ESGN, COAC N° 4/83 "C" fojas 6 y 7).

Dadas las restricciones presupuestarias previsibles, considero que las construcciones citadas serían factibles en el mediano plazo, pero deben ser mantenidas como objetivo a alcanzar, dadas las actuales limitaciones de la Armada en sus capacidades Anfibias y de Sostén Logístico Móvil. Asimismo aprecio sería factible encarar en el corto plazo los correspondientes estudios de factibilidad, de manera de reducir tiempos muertos cuando se disponga de las correspondientes asignaciones presupuestarias.

Finalmente, cabe expresar que en la situación actual, la Armada no puede satisfacer algunas de las Responsabilidades Primarias establecidas en el art. 121 b. de la publicación DOCFUARA.

AGREGADOS: Lo indicado en el texto.

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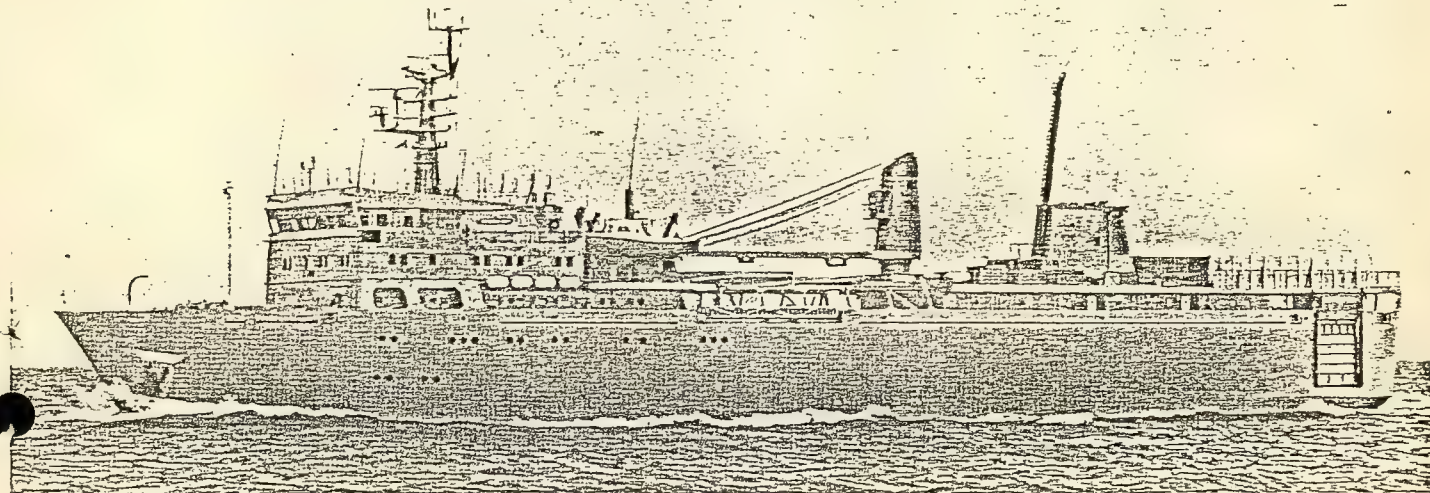
MIGUEL ANGEL GRONDONA  
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## BREMER VULKAN



The Sri Indera Sakti during trials in the North Sea in October 1980

## MULTI-PURPOSE SUPPORT AND COMMAND SHIP — KD SRI INDERA SAKTI

On the 24th October 1980, Bremer Vulkan delivered to the Royal Malaysian Navy, only twelve months and three weeks after signing the contract, the Multi-purpose Support and Command Ship KD *Sri Indera Sakti*.

In April 1979 the RMN called for bids concerning a Multi-Purpose Support Ship, based on either the conversion of an existing Ro-Ro-ferry or a new construction, with a delivery period of from 6 to 12 months. It became apparent that only an entirely new design could cater to the variety of roles envisaged. These are:

- ☐ Support Ship for a squadron of small units in an operational area remote from a base.
- ☐ Assume, within limits, the role of Command and Communications Centre.
- ☐ Perform as a forward Hospital.
- ☐ Act as a Training Ship for up to 50 cadets.
- ☐ To have the capability of operating helicopters up to 4.5 tons weight.
- ☐ To transport equipment, ammunition and missiles — loose or containerised.
- ☐ To transport a battalion of troops and their equipment.
- ☐ To transport vehicles with wheel load of up to six tons.
- ☐ To operate independently for a period of two months away from a base.
- ☒ To be operational for at least 12 months between dockings and 24 months between refits.

Bremer Vulkan alone offered a tailor made new ship with a 12 months delivery.

### Main Characteristics:

Length overall	100.0 m
Length at waterline	93.6 m
Breadth	15.0 m
Depth to car deck	6.0 m
Depth to main deck	11.0 m
Draft	4.7 m
Deadweight	2,000 tons
Tank capacity (support):	
Fuel	1,350 t
Water	200 t
Engine output (tropical)	2 x 2,200 kW
Speed	16.8-kt
Range	14,000 nm
Complement	140 persons

### General

The design object for the Support Ship was to maximize efficiency whilst retaining simplicity.

The vessel is built according to Lloyd's Register Class 100 A1. Special emphasis was given to the subdivision of the vessel in view of damage stability. The vessel is able to withstand a flooding of any two adjacent compartments in accordance with the Rules for Passengerships of the International Convention for the Safety of Life at Sea.

To meet the aim of delivery within 12 months it is not especially necessary to

point out that this can only be achieved by good management, organisation and design staff (in addition to the design of the F 122 Class frigates) but also by reducing the man-hours in yard considerably. This was achieved by the extensive use of shop prefabrication and standardisation.

### Ship

The hull of the vessel, based on the yard's experience with more than one thousand ships of all kinds, was designed with a bulbous bow, flaring out bow and transom stern to meet the criteria of maximum speed and best sea keeping capabilities. Tank tests were carried out in a deep water model basin to predict the speed and to confirm the estimated engine output. The MPSS was designed with double screw, twin rudder and bow thruster especially for manoeuvring in restricted waters.

The results achieved during extensive sea trials under severe weather conditions (gale force Bf. 8 +) not only fulfilled but even exceeded the predictions. Also the anti-heeling and stabilisation tank plant, installed in order to reduce roll movement, in addition to the bilge keels, produced excellent results.

The hull, with two continuous and two partial decks, is entirely built of mild steel and subdivided by 3 longitudinal and 15 transverse bulkheads into 46 watertight compartments. A Damage Control Headquarters is installed.





# BREMER VULKAN

## Accommodation and Outfit

Generally, the ship is divided into two parts. Whilst the crew is accommodated in the forward part, the aft part is arranged for cargo space and various workshops.

The crew's accommodation is of highest standard and fully air-conditioned. The workshops, fitted with the necessary tools and equipment, have a total area of about 200 m<sup>2</sup>.

Workshops:	
Hull	35 m <sup>2</sup>
Engine	55 m <sup>2</sup>
Carpenter	25 m <sup>2</sup>
Electric	40 m <sup>2</sup>
Electric	30 m <sup>2</sup>
Battery	15 m <sup>2</sup>

For carrying out underwater repairs there is a large Diver's store in which a decompression chamber is installed.

For Replenishment At Sea, there are three stations, one at the stern and two athwart ship. Handling of solid goods, including SS missiles, will be done by the slewing crane, with a SWL of 15 tons. Light jack stay stations are abreast the funnel. The whole arrangement is in accordance with NATO-Regulation ATP-16. Solid goods are stored on the main deck in 10 containers. The store area is provided with removeable covers. Each container storage space is provided with water connection and electric power sockets.

The vehicle deck, which has an area of over 600 m<sup>2</sup>, is designed and constructed for vehicles up to 6 tons axle load, and for troops on short voyages. Access to the vehicle deck is provided by the two stern-quarter ramps, while for the personnel of support boats the shelldoors are used.

Additional sanitary facilities are arranged for the crew of supported boats and for the troops carried on board.

On the 01 deck aft there is a landing platform for medium size helicopters up to a take-off weight of 4.5 tons. A refueling station is fitted.

To avoid heeling during loading/unloading and outboard repairworks, a very effective automatic anti-heeling plant is installed. This plant is used during voyage or laying at anchor as a stabilisation system.

To fulfil the role of a Command Ship it was necessary to install a communication system as normally installed on board corvette/frigate size ships.

The hospital of the MPSS is accessible for the ships crew as well as for the crew of the supported boats. The hospital includes an Anteroom, an Operating Theatre, a bedroom fitted with a total of 10 swinging and fixed berths, a bath and a large medical store.

As a training ship the MPSS is equipped for 50 cadets plus the additional personnel required. The accommodation of cadets is the same as for the Junior Rates and they have their own gun room. In addition there is a combined class/briefing/conference room which has a seating capacity of 55 persons and fully equipped with tables, lockers, boards and a/v aids. The wheelhouse was designed to allow sufficient space for ship command as well as for the cadets. The equipment of the wheelhouse includes a satellite navigation system.

## Machinery Plant and Electrical System

Two Medium speed Diesel engines were installed, to meet the requirements that the MPSS should be able to operate 24 months between refits and have a high operational availability. The chosen diesel engines were KHD — Type SBV6M540 which are able to work with fuel according to Marine Diesel Oil British Standard 2 (MDOB2). Each diesel engine drives a controllable pitch propeller via a single reduction gear. To avoid the problem of marine growth the shafts and the bearings run in oil filled tubes. The whole propulsion plant is remote controlled from the bridge as well as from the Engine Control Room.

Two 24 tonnes per day fresh water evaporators are installed to provide all water needs. The electrical power is delivered by 2 x 2 diesel generator sets. Two diesel generators are sufficient for the ship's load and to deliver electric power for the boats to be supported. In addition enough growth potential for further installations was taken into account. According to class regulations one air-cooled emergency generator was also installed. All three engine rooms are

easily accessible from the vehicle deck for the repair-by-refit method.

## Weapons and Electronics

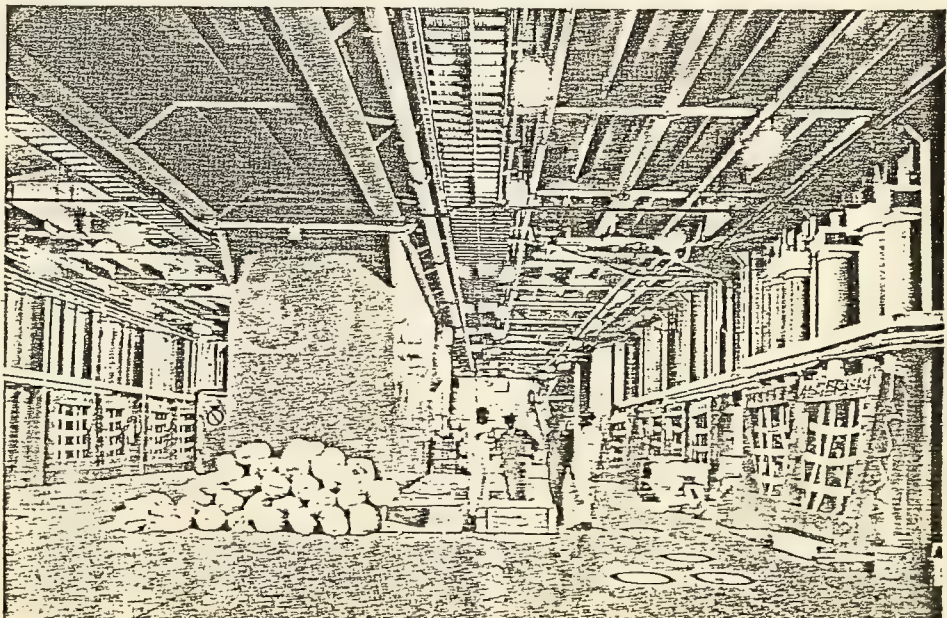
The ship was designed to carry a wide range of weapons, radars and fire control equipment. The Royal Malaysian Navy decided to install, beside the two 3 cm and 10 cm navigation radar systems, a long range surveillance radar and a self protection armament consisting of one 57 mm gun and two 20 mm anti aircraft guns.

## Logistic Support

The logistic concept agreed with the representatives of the Royal Malaysian Navy stationed at the shipyard throughout the contract period was that the manufacturers' manuals as well as drawings, spare parts lists, maintenance schedules and job information cards were to be grouped according to a division breakdown into H (hull), E (engineering), L (electrical), R (radio). This would allow the user to refer with ease from one category of software to the other, for instance from the Ship's Equipment List to the Board Spares List and from there to the respective Maintenance Schedule, including Job Information Cards and Status Work Sheets. The system aspect was accounted for by compiling a Systems Information Book, whose coloured drawings were also used for training purposes.

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The vehicle deck showing the large amount of interior space for a ship of this size







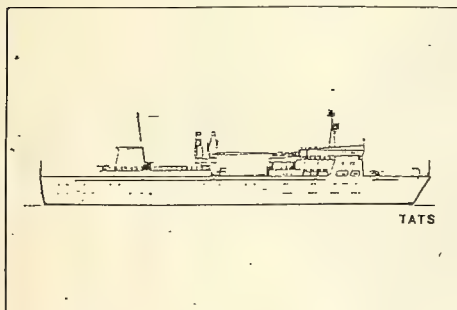
# BREMER VULKAN

## SUPPORT SHIPS

During the construction phase of the MPSS KD *Sri Indera Sakti*, Bremer Vulkan started, based on enquiries of other Navies, on further development of this type. After these investigations showed that the hull of the MPSS could fulfil the various requirements without changes the following designs were developed.

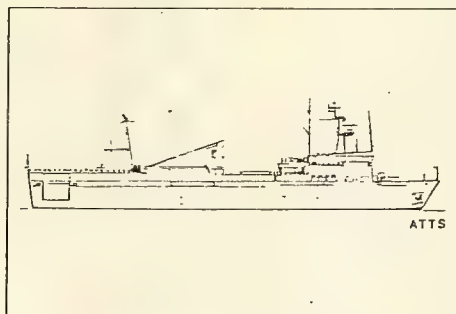
### Troop and Ammunition Transport Ship (TATS) Ammunition and Tank Transport Ship (ATTS)

This vessel is able to transport 600 troops and 50 Officers over a long distance. Every soldier has a berth and a locker. For the troops a separate galley with provision rooms is provided. Very spacious sanitary facilities are also



provided. Up to 800 tons of ammunition can be transported in 2 holds which are subdivided into six compartments. For landing the troops ashore two LCVs are used on the main deck. Hoisting and lowering will be done by a double crane with a SWL of 16 tons which is also used for loading/unloading of ammunition. The self-protection component of this design consists of two twin 30 mm Emerlec guns.

The first role of this design is to transport 18 Main Battle Tanks, each with a weight of 40 t, and 12 trucks, each with a weight of 12 tons. Special arrangement for this role are three stern ramps and a



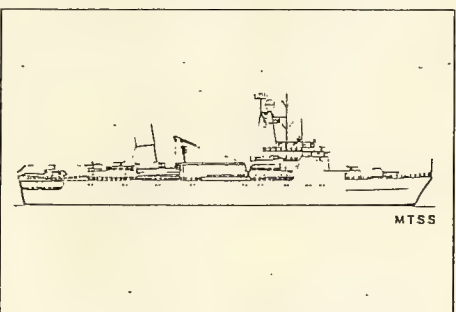
moveable interior ramp connecting the vehicle deck with the main deck. For this design the hull was lengthened by 5.85 m.

The second role is the transport of six different types of ammunition in addition to missiles, pyrotechnics, lachrymatory, smoke and phosphorus ammunition. The arrangement of the ammunition holds/compartments is such that each kind of ammunition is directly accessible. Handling of the ammunition inside is done by means of a forklift truck whilst all loading/reloading, and that of the army trucks, will be done by a slewing crane with an outreach of 20 metres.

A 57 mm gun and two 20 mm guns are provided for self-protection.

### Multi-Purpose Training and Support Ship (MTSS)

This type is designed to accommodate more than 300 cadets and their training personnel. There are eleven dormitories for the cadets including their own gun



room for about 50% of the total number and sanitary spaces of adequate number. Beside the three classrooms there are a library, workshops and a cadets' bridge, fitted with all relevant equipment and a repeat of the bridge console but without any command facilities.

Great value was given in this design to get easy accessibility to the three engines room for the exchange of big equipment.

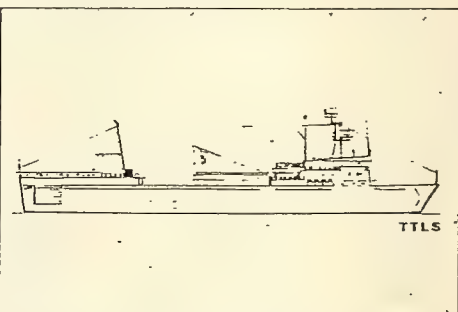
To assume the role as a support ship there are three replenishment stations and a large cargo hold with a capacity of 1,000 m<sup>3</sup>. On the main deck four places for containers are arranged, each fitted with water and electric power supply.

As a training ship this design has a fully equipped Combat Information Centre with the related electronic rooms and is layed out to carry every weapon and sensor configuration requested, up to a 5 inch gun and SS-/SA-Missiles. A very careful arrangement of access routes and foundation, in connection with the wide use of functional groups, was chosen in order not to destroy the hull structure by large openings or adding additional weight. The armament consists of one 76 mm gun, two 40 mm guns, four 20 mm anti-aircraft guns and two 50 cal. machine guns.

For landing exercises four LCVs, two under each pair of the davits, are carried on board.

### Tank Transport and Landing Ship (TTLS)

This design has the capability to transport up to 18 MBTs and 21 trucks and 23 other vehicles, or any combination of these, over a distance of 10,000 nautical miles and to accommodate up to 500 Troops including Officers.



For landing the vehicles ashore the Ro-Ro type design is layed out with a 20 m bow ramp, which can also be used as a loading ramp beside of the stern ramp. Two 20 mm anti-aircraft guns are fitted for self-defence.

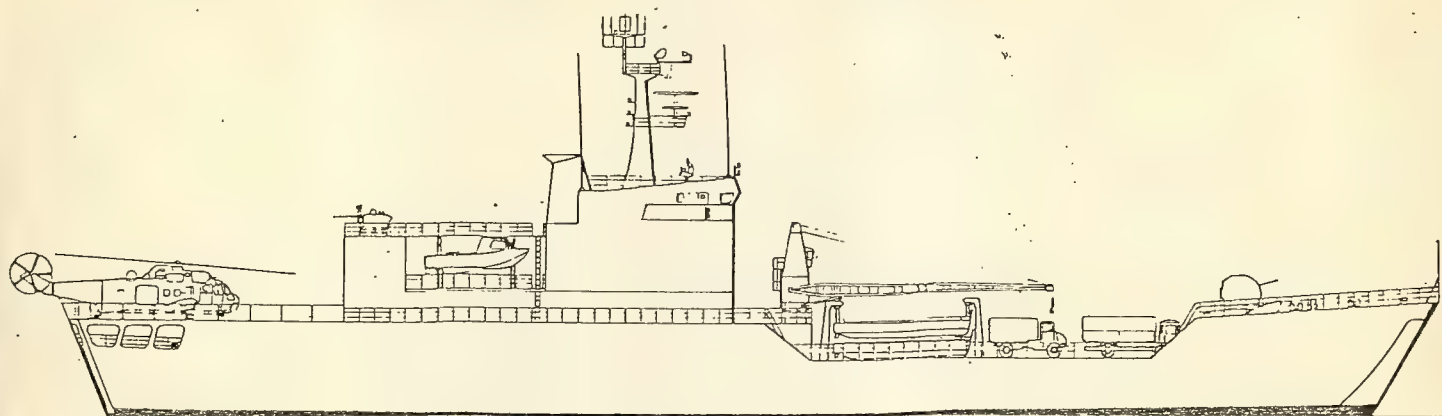
Common to all designs is the helicopter landing platform which is layed out for helicopters up to a take-off weight of 4.5 tons and in the case of the TTLS up to a take-off weight of 9.5 tons.

	TATS	ATTS	MTSS	TTLS
Loa	100.0	105	105	105
Bwl	15.0	15.0	15.0	15.0
D	11.0	11.0	11.0	11.0
d	4.7	4.7	4.7	4.7
Engine	2 x KHD	2 x KHD	2 x MTU	2 x KHD
Output	6,000 PS	6,000 PS	8,000 PS	6,000 PS
speed	16.5	16.5	18.0	16.5
Special	650 Troops	18 MBT	300 Cad	18 MBT
features	800 t Amm.	12 Trucks	1,000 m <sup>3</sup> Hold	44 Vehicles
		500 t Amm.	Capacity	500 Troops
				100 t Ammunition
Landing Craft	2 LCV	-	4 LCV	-
Crane	2 x 8 t	1 x 10 t	1 x 15 t	1 x 10 t





# BREMER VULKAN



## LANDING SHIP (LST 20)

other design developed by Bremer Vulkan to commercial standards is notable for its versatility, namely a Landing Ship of modern generation with helicopter platform and hangar. This vessel can land forces and withdraw them. She can provide logistic support to land operations and can give the navy, army or the marines increased flexibility in deployment.

This Ro-Ro design combines in one hull a Troop Transport and a Heavy Vehicle Transport. She can beach herself or land men and equipment by landing craft, pontoon causeway or helicopter. A special feature of this vessel is its helicopter-hangar which is capable to housing up to two Sea King-size helicopters. Repair and maintenance facilities for the ship-borne helicopters are provided in

In addition to the bow ramp (22 x 4.5 m) and the stern ramp, interior ramps connect the main deck and the tank top with the "tank deck". A hatch gives entrance from the main deck through the tank deck and into the hold.

The vessel will have a significant range and endurance. The hull size is affected by the number of tanks carried and also by the conditions in the operational sea as well as slope of beach. The LST represents a valuable asset in her ability to transport and deliver personnel and equipment to inaccessible or inhospitable locations. It can also undertake in peace time the role of disaster relief.

### Main Particulars:

Length overall	100.00 m
Breadth	16.00 m
Design Draught	3.75 m
Displacement	abt. 4,100 t
Propulsion Power	6,000 PS
Trial speed	16 kt
Complement	117
Troops	200

Landing craft	2 x 2 LCVP
Tanks	18
Vehicles	10
Helicopter	2 x up to 9.5 t class helicopter
Hangar	for 2 Helicopters
Armaments	2 x 30 mm twin guns 1 x 40 mm twin gun.

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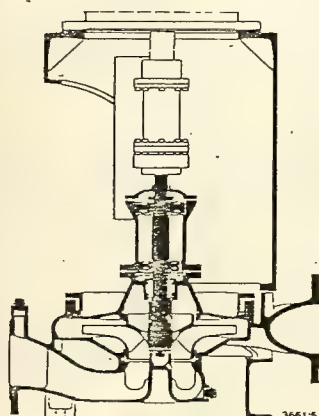
Send for free information on the latest developments in ship pump technology, for example on the spiral-housing centrifugal pump for the RSV ship product line.

Division of Naval and Ship Pumps  
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CONFIDENCIAL



BUENOS AIRES,

10 NOV 1983

OBJETO: E/Fotocopias suplemento especial.

AL SEÑOR JEFE DEL ESTADO MAYOR GENERAL DE LA ARMADA.

Adjunto elevo fotocopias de las páginas 32, 33, 40 y 44 del Suplemento Especial "BREMER VULKAN" de la revista "NAVAL FORCES" Nº IV/83 para ser agregadas como Anexo FOX TROT al informe producido por esta Comisión, referido a "ALISTAMIENTO DE MEDIOS NAVALES", que fuera elevado por Oficio ESGN, COAC Nº 4/83"C".

Dichas páginas contienen información básica de diversas unidades de desembarco y de sostén logístico de dimensiones modestas y diseño aparentemente simple, cuya construcción podría encararse en el país.

Aprecio que la eventual construcción de tales unidades constituye un modo de acción alternativo a los ya expuestos en los puntos 4.1 y 4.2 del informe de referencia Of. ESGN, COAC Nº 4/83"C" fojas 6 y 7).

Dadas las restricciones presupuestarias previsibles, considero que las construcciones citadas serían factibles en el mediano plazo, pero deben ser mantenidas como objetivo a alcanzar, dadas las actuales limitaciones de la Armada en sus capacidades Anfibias y de Sostén Logístico Móvil. Asimismo, aprecio sería factible encarar en el corto plazo los correspondientes estudios de factibilidad, de manera de reducir tiempos muertos cuando se disponga de las correspondientes asignaciones presupuestarias.

Finalmente, cabe expresar que en la situación actual, la Armada no puede satisfacer algunas de las Responsabilidades Primarias establecidas en el art. 121 b. de la publicación DOCFUARA.

AGREGADOS: Lo indicado en el texto.

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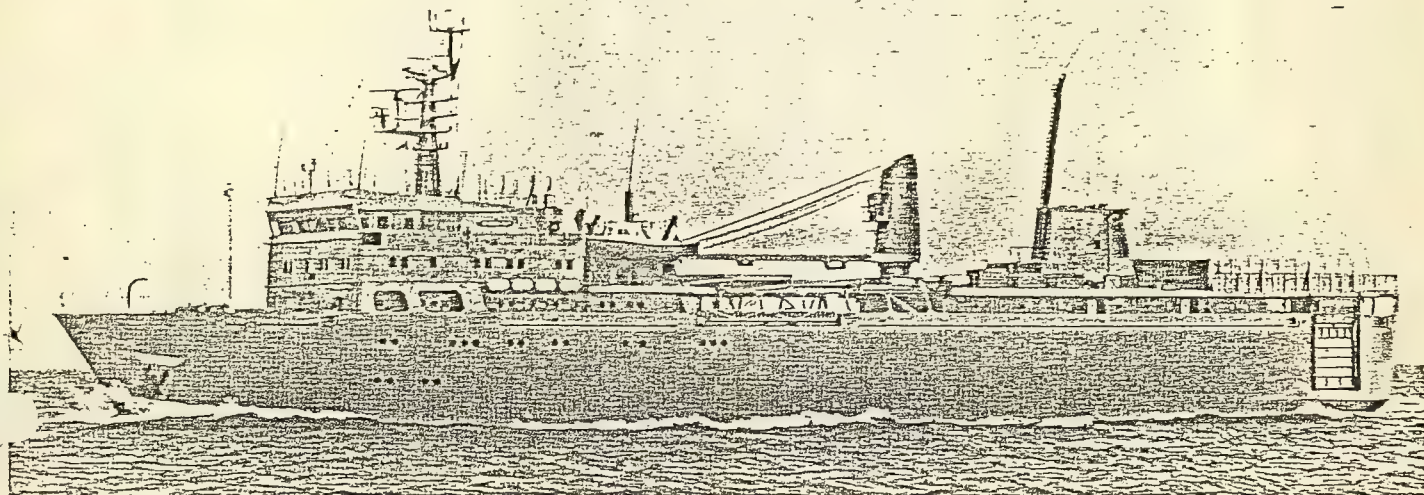
JORGE MARCELO DELECLUZE  
CAPITAN DE FRAGATA  
JEFE

MIGUEL ANGEL GRONDONA  
CAPITAN DE NAVIO  
A CARGO DE LA PRESIDENCIA



6.0  
1.5

## BREMER VULKAN



The Sri Indera Sakti during trials in the North Sea in October 1980

## MULTI-PURPOSE SUPPORT AND COMMAND SHIP — KD SRI INDERA SAKTI

On the 24th October 1980, Bremer Vulkan delivered to the Royal Malaysian Navy, only twelve months and three weeks after signing the contract, the Multi-purpose Support and Command Ship KD *Sri Indera Sakti*.

In April 1979 the RMN called for bids concerning a Multi-Purpose Support Ship, based on either the conversion of an existing Ro-Ro-ferry or a new construction, with a delivery period of from 6 to 12 months. It became apparent that only an entirely new design could cater to the variety of roles envisaged. These are:

- ☐ Support Ship for a squadron of small units in an operational area remote from a base.
- ☐ Assume, within limits, the role of Command and Communications Centre.
- ☐ Perform as a forward Hospital.
- ☐ Act as a Training Ship for up to 50 cadets.
- ☐ To have the capability of operating helicopters up to 4.5 tons weight.
- ☐ To transport equipment, ammunition and missiles — loose or containerised.
- ☐ To transport a battalion of troops and their equipment.
- ☐ To transport vehicles with wheel load of up to six tons.
- ☐ To operate independently for a period of two months away from a base.
- ☐ To be operational for at least 12 months between dockings and 24 months between refits.

Bremer Vulkan alone offered a tailor made new ship with a 12 months delivery.

### Main Characteristics:

Length overall	100.0 m
Length at waterline	93.6 m
Breadth	15.0 m
Depth to car deck	6.0 m
Depth to main deck	11.0 m
Draft	4.7 m
Deadweight	2,000 tons
Tank capacity (support):	
Fuel	1,350 t
Water	200 t
Engine output (tropical)	2 x 2,200 kW
Speed	16.8 kt
Range	14,000 nm
Complement	140 persons

### General

The design object for the Support Ship was to maximize efficiency whilst retaining simplicity.

The vessel is built according to Lloyd's Register Class 100 A1. Special emphasis was given to the subdivision of the vessel in view of damage stability. The vessel is able to withstand a flooding of any two adjacent compartments in accordance with the Rules for Passengerships of the International Convention for the Safety of Life at Sea.

To meet the aim of delivery within 12 months it is not especially necessary to

point out that this can only be achieved by good management, organisation and design staff (in addition to the design of the F 122 Class frigates) but also by reducing the man-hours in yard considerably. This was achieved by the extensive use of shop prefabrication and standardisation.

### Ship

The hull of the vessel, based on the yard's experience with more than one thousand ships of all kinds, was designed with a bulbous bow, flaring out bow and transom stern to meet the criteria of maximum speed and best sea keeping capabilities. Tank tests were carried out in a deep water model basin to predict the speed and to confirm the estimated engine output. The MPSS was designed with double screw, twin rudder and bow thruster especially for manoeuvring in restricted waters.

The results achieved during extensive sea trials under severe weather conditions (gale force Bf. 8 +) not only fulfilled but even exceeded the predictions. Also the anti-heeling and stabilisation tank plant, installed in order to reduce roll movement, in addition to the bilge keels, produced excellent results.

The hull, with two continuous and two partial decks, is entirely built of mild steel and subdivided by 3 longitudinal and 15 transverse bulkheads into 46 watertight compartments. A Damage Control Headquarters is installed.





# BREMER VULKAN

## Accommodation and Outfit

Generally, the ship is divided into two parts. Whilst the crew is accommodated in the forward part, the aft part is arranged for cargo space and various workshops.

The crew's accommodation is of highest standard and fully air-conditioned. The workshops, fitted with the necessary tools and equipment, have a total area of about 200 m<sup>2</sup>.

### Workshops:

Hull	35 m <sup>2</sup>
Engine	55 m <sup>2</sup>
Carpenter	25 m <sup>2</sup>
Electric	40 m <sup>2</sup>
Electric	30 m <sup>2</sup>
Battery	15 m <sup>2</sup>

For carrying out underwater repairs there is a large Diver's store in which a decompression chamber is installed.

For Replenishment At Sea, there are three stations, one at the stern and two athwart ship. Handling of solid goods, including SS missiles, will be done by the slewing crane, with a SWL of 15 tons. Light jack stay stations are abreast the funnel. The whole arrangement is in accordance with NATO-Regulation ATP-16. Solid goods are stored on the main deck in 10 containers. The store area is provided with removeable covers. Each container storage space is provided with water connection and electric power sockets.

The vehicle deck, which has an area of over 600 m<sup>2</sup>, is designed and constructed for vehicles up to 6 tons axle load, and for troops on short voyages. Access to the vehicle deck is provided by the two stern quarter ramps, while for the personnel of support boats the shell doors are used.

Additional sanitary facilities are arranged for the crew of supported boats and for the troops carried on board.

On the 01 deck aft there is a landing platform for medium size helicopters up to a take-off weight of 4.5 tons. A refueling station is fitted.

To avoid heeling during loading/unloading and outboard repairworks, a very effective automatic anti-heeling plant is installed. This plant is used during voyage or laying at anchor as a stabilisation system.

To fulfil the role of a Command Ship it was necessary to install a communication system as normally installed on board corvette/frigate size ships.

The hospital of the MPSS is accessible for the ships crew as well as for the crew of the supported boats. The hospital includes an Anteroom, an Operating Theatre, a bedroom fitted with a total of 10 swinging and fixed berths, a bath and a large medical store.

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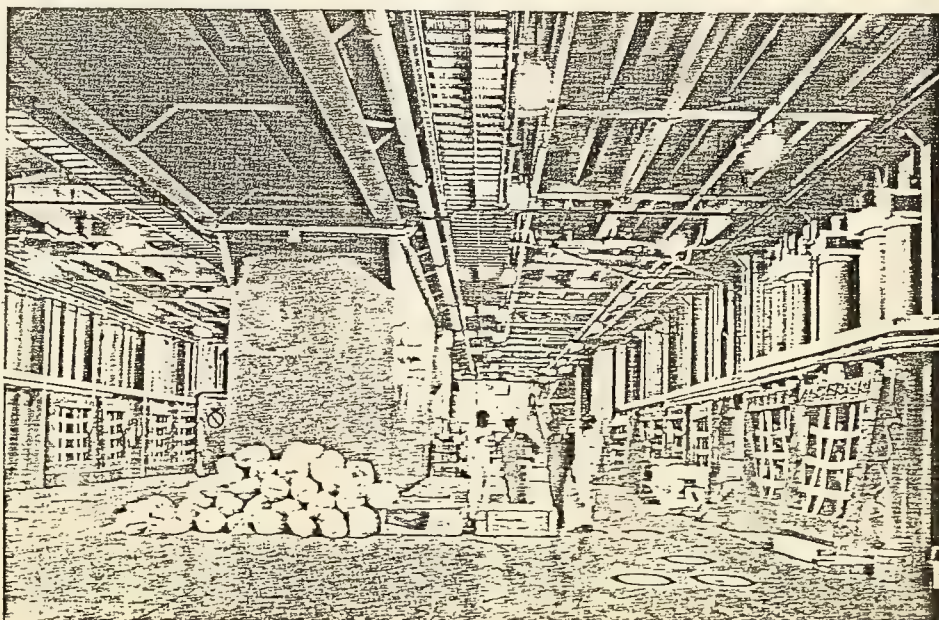
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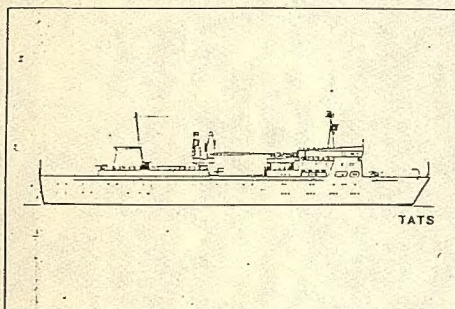
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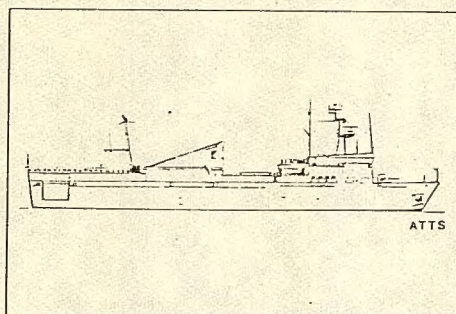
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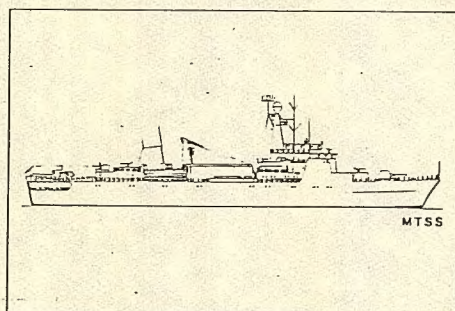
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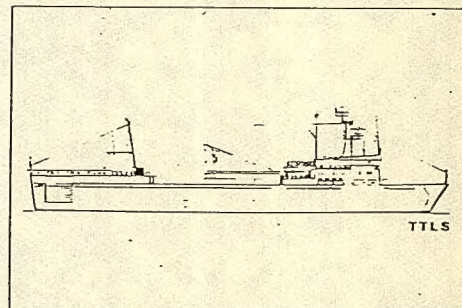
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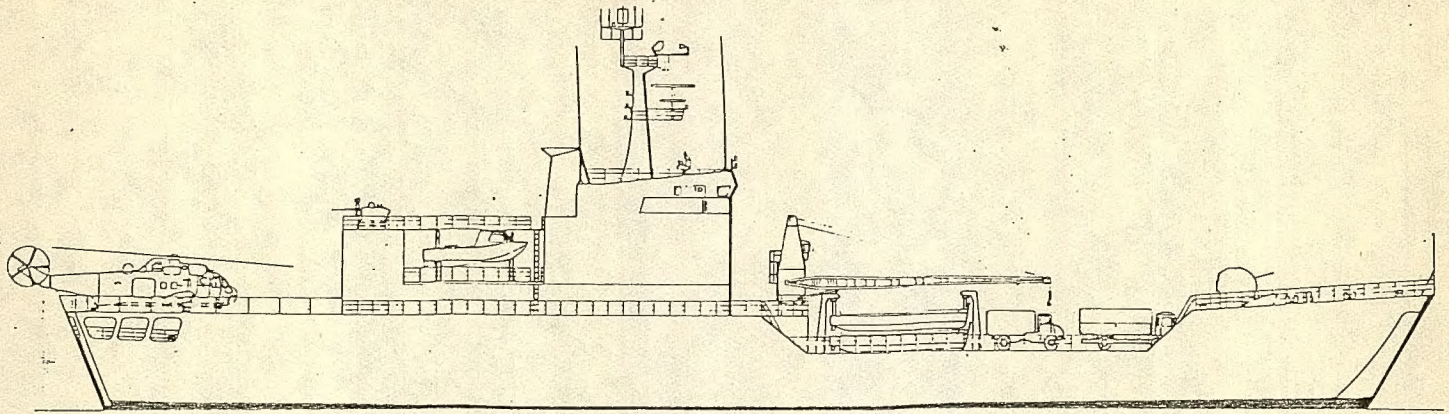
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Landing Craft	2 LCVP	-	4 LCVP	-
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# BREMER VULKAN



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comes from KSB!  
Because KSB's many years of experience in ship pumps and intensive research and development are the basis for a high quality pump programme which meets all requirements.

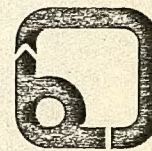
Send for free information on the latest developments in ship pump technology, for example on the spiral-housing centrifugal pump for the RSV ship product line.

Division of Naval and Ship Pumps

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**KSB pumpen**



